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ABSTRACT

Evaluated were the cognitive and social development of 40 orthopedially handicapped children ages 6 to 12 years. Social development was measured by the Children's Social Relations Rating Scale, the Children's Social Relations Interview Schedule, and the Children's Role Taking Task. The Concrete Operations Tasks assessed cognitive ability. Data supported the hypotheses that Ss would enact the patient (dependent) role and the nondisabled control group would enact the agent (independent) role. Only partial support was demonstrated for the hypothesis that the Ss' cognitive task scores would be significantly lower than the control group's scores. Analysis of the level of role taking indicated that the social restriction produced by an orthopedic handicap decreased with age. (CL)

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SOCIAL EXPERIENCE AND THE DEVELOPMENT OF SOCIAL COGNITION IN ORTHOPEDICALLY DISABLED AND NON DISABLED CHILDREN

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Piaget's theory of cognitive development relates change to the interplay of the child's existing mental structures and properties of the physical and social world. Although numerous studies exist depicting the course of cognitive development in relation to maturation and physical experience, there are few suggestions in Piaget's (1950; 1967; 1969; 1971) work as to the nature of environmental influences affecting development.

Since the work of Feffer (1959) and Flavell (1966) there have been a number of reports indicating that role taking activity or cognizing the role attributes of the other develops between the ages of six and twelve (Feffer 1970; Feffer and Gourevitch, 1960; Feffer and Sucholiff, 1966; Flapman, 1968; Flavell, 1968; 1973; Kohlberg, Yaeger, and Hjertholm, 1968; Selman 1971a, 1971b; Smith 1973; and Wolfe, 1963).

In Piaget's conceptual scheme this phase is marked by the achievement of concrete operations and the capacity to "decenter" or shift perspective on phenomena. According to G. Mead (1934), this period involves a transition from the "play stage" characterized by enacting the role of significant others to the "game stage" characterized by enacting the role of generalized others. Prior to this epoch children are egocentric; unable to shift perspectives by taking the role of others. Because the achievement of concrete operations and role taking activity appear to be interrelated, the term social cognition will be used to subsume them both (Feffer, 1959; Rubin and Schneider, 1973). Moreover, this term helps to eliminate confusion with basic empathetic processes (Borke, 1971; Chandler and Greenspan, 1972).

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While social cognition and the attending decline of egocentrism and rise of perspectivism are well documented, the social experiences contributing to these changes remain unspecified (Kessen, 1962). An attempt has been made in this paper to make explicit some of the social experiences implicated in this transformation by comparing the development of social cognition in orthopedically disabled and non disabled children.

The purpose of this investigation was to test the assertion that the transition from egocentricity to perspectivism is in part, a response to the interplay of maturational predispostions and social forces requiring the child to take into account the role attributes of others. Unlike egocentricity, which is an incapacity to distinguish one's own point of view from that of others, perspectivism is a form of thought that enables the perspective of others to be compared, contrasted, and coordinated.

This developmental achievement assumes that the child has had optimal opportunities for interaction with the environment. The rationale presented here suggests that a child cannot take the role of the other if he lacks the necessary cognitive capacity and role expectations. That is, the child must be able to organize the action of persons around positions for which he has learned and developed a prescribed set of rules, rights, and duties. Interpersonal acts are organized within a cognitive frame work of role expectations that are acquired in the course of social experience and involvement. As Mead argued, role taking activity is a consequence of the acquisition of symbols and a progressive cognizance of their significance in social interaction. In short, a person cannot take a role for which he has no expectations.

Cognitive development is in part, therefore, a function of environmental experiences. Change in environment is required to force the accommodation of modifying schemata that constitute development. Thus, the greater the variety of situations to which the child must accommodate his behavioral structures, the more differentiated and complex cognitive structures become. It follows that if environmental stimulation or deprivation affects conceptual structure, one variable that might enhance or detract from ongoing development could be social status. Deutsch (1963) notes that the often cited importance of variety in environment to development implies a detrimental effect of lack of variety. Restiction in variety of social experience and involvement might lead to a systematic ordering of stimulation sequence that could curtail growth and activation of cognitive potential and operate to retard cognitive development. Since more mature levels of development are built upon the orderly progression through stages involving active interaction between the child and his environment the lower status child may progress through these stages at a lower rate as compared to children who do not undergo this form of restriction of experience (Sullivan and Hunt, 1967).

A number of studies have found that restrictions arising from social class, ethnic group, urban-rural residence, social isolation, child rearing and role taking model differences affect social and cognitive development. (Chandler, 1972, 1973; Chandler et.al., 1974; Estivan, 1958; Gough, 1948; Hess and Shipmen, 1966; Hollos and Cowan, 1973; Neale, 1966; Sarben, 1954; Sullivan and Hunt, 1967). Research reports on the sociological implications of physical handicap indicate that orthopedic disability involves low status and impedes social interaction (Barker, 1948; Myerson, 1968; Richardson, 1963; 1969; Richardson, Goodman and Hastorf, 1961; Wright, 1960).

Disability, viewed as a form of both physical and social deviation, implies a position that has role expectations different from that of the non disabled. Consequently, it may be asserted that the disabled person's social experience and involvement will differ from that of the non disabled. Dependency, an excessive reliance on others, is the major role expectation associated with disability (Dembo, 1960; Richardson, 1963; Shere, 1957). The low level of activity and variety implied by the dependent position of the disabled may be of consequence in the development of social cognition. To date most studies in this area have focused on the restrictive nature of disability and provide little information as to its possible social psychological and developmental implications.

Three empirical generalizations follow from the rationale outlined above. First the achievement of concrete operations and the development of role taking activity are interrelated. Second, typical concrete operations and role taking activity are a function of unrestricted social experience and involvement. Finally, orthopedic disability restricts social experience and involvement and impedes the achievement of concrete operations and the development of role taking activity. These propositions are summarized in the following general hypothesis and four specific hypotheses. The specific hypotheses are stated in terms of indicators outlined in the next section.

General hypothesis:

The achievement of concrete operations and role taking activity are a function of agent role enactment and are retarded by the enactment of the patient role.

Specific hypotheses:

1. The disabled group of children will enact the patient role to a significantly greater extent than the non disabled.

2. The non disabled children will enact the agent role to a significantly greater extent than the disabled group of children.

3. The disabled group of children will display a significantly lower level of achievement of concrete operations than the non disabled group of children.

4. The disabled group of children will display a significantly lower level of role taking activity than non disabled group of children.

Method

Subjects

Eighty children participated in this investigation. Forty were selected from a hospital school for the orthopedically disabled and forty were drawn from a public school. Half of each group were between the ages of six and eight and the other half were between the ages of nine and twelve. Both groups contained equal numbers of boys and girls and were restricted to children Canadian born, English speaking, and whose major provider's occupation fell into the middle classes of Blishen's Class Scale for Canada (Blishen, 1958). In addition, the subjects were limited to children whose available I.Q. scores, when standardized to Binet scores, ranged between 85 and 125.

The disabled group was further restricted to day patients and those whose status had changed within the last school term to that of out "patient". This imposition was made to minimize possible effects of institutionalization. Moreover, the group was limited to severe orthopedically disabled children, i.e. children requiring mechanical or human assistance in movement. The types of disability included were congenital deformities and cerebral palsy. Although most orthopedic disability involves some central nervous system damage, it was possible, on the basis of various assessments available in hospital records, to minimize this effect by further restricting the disabled group to children without speech, sight, and hearing impairments that required special therapy.

Children in the two subject pools were matched according to age, sex and I.Q. These variables were selected on the basis of consistently reported correlates of the development of social cognition (Feffer, 1959;

Feffer and Gourewitch, 1960; Feffer and Sucholiff, 1966; Flavall, 1963; 1968; Inhelder and Sinclair, 1969; Kohlberg, 1969). When more than one subject met the match criteria as a pair mate, assignment was randomly made on the basis of a coin flip. The matched pool consisted of some sixty-five pairs from which the forty final pairs were randomly selected.

Measures

Concrete Operations Tasks (C.O.T.)

The cognitive tasks selected for use in this study are those that have been found to reflect the earliest achievements in concrete operations. Since little or no study of the performance of disabled children on concrete operations tasks have been undertaken the most basic acquisistions were selected for assessment: namely, conservation of quantity and the later appearing concept of weight, formation of classes and the serialization of asymmetrical relations (Flavell, 1963). Cognitive development is operationally defined in terms of the following indicator's of the attainment of concrete operations:

1. *Conservation of quantity and weight - clay problems.*

This problem involved a ball of clay being presented to the child, another one placed in front of the investigator. The investigator changes his ball of clay into a sausage shaped roll, a flat pancake, and five round balls. In each instance the child is asked to indicate if the two pieces of clay original and transformed, remain the same in terms of quantity and weight. That is the child is asked if there is the same amount or weight in the transformed and untransformed balls of clay. So as to avoid repetition bias, the quantity task is given last following the other tasks.

2. *Classification - marble problem.*

This task involved a marble problem to determine the child's ability to form classes. Seventeen green and three yellow glass marbles are placed in front of the child. He is then asked if there are more green or more glass marbles. Further, he is asked whether there would be any marbles left if all the

green marbles were taken away.

3. *Serialization - straw problem.*

To determine if the child can serialize asymmetric relations, a task involving plastic straws of varying lengths was devised. The subject is asked to place in order the random mixed straws according to length, starting with the smallest. The child is then asked to hand the straws to the investigator starting with the largest.

The subject's responses to these tasks were scored either right or wrong. Since these operations emerge, with the exception of the concept of weight, concomitantly they were all given the same weight (Flavell, 1963). Scoring was on the basis of the total number of correct responses. Possible scores ranged from 0-4, the weight and quantity task 0-3, the classification task 0-4, and the serialization task 0-2. The crucial wording, probes, and order of presentation of these tasks followed the "Method Clinique" outlined by Piaget (Piaget, 1969; Gorman, 1972).

The Children's Role Taking Task (C.R.T.T.)

This task was derived from the Feffer Role Taking Test and the Schneidman Make A Picture Story Test (Feffer and Schnall, 1967; Schneidman, 1955). The materials in the C.R.T.T. consist of two background pictures with three persons in each. The first scene has a living room as background with a little boy or girl (character of the same sex as the subject is used in the scene) and a mother and a policeman. The second scene takes place in an attic with a boy, girl, and a man present. The child is asked to make up a story about each scene and then retell if from the point of view of each character in the story other than that of the child character of the same sex. This restriction assumes that the subject's initial story will be from the point of view of self as projected into the role of the same sexed character. The C.R.T.T. performance is evaluated in terms of the degree

to which the subject is able to shift from the initial orientation, and refocus (decenter) upon the actors from different roles, while maintaining continuity between his versions of the initial story. In demonstrating role taking activity, the child evidences a type of decentering that is coordinated with previous and anticipated focusing. Conversely, the lack of consistency or coordination between viewpoints is taken as inadequate role taking activity, and indicates shifts of focus that are not guided by the perspectives of others. These considerations are the basis of the coding and scoring categories which are ordered in terms of the degree to which an increasing number of aspects of a situation are simultaneously considered. The four scoring categories - simple refocusing, consistent elaboration, perspective elaboration, and change of perspective - were analyzed in terms of two initial stories with two retellings per story. Level of achievement in each scoring category ranges from 0-5 and when added and averaged for the four retellings a total score from 0-20 is obtained.

Children's Social Relations Interview Scale (C.S.R.I.S.)

The role expectations associated with disability, namely dependence and low status, and role behaviors indicative of these aspects of their position were investigated in role sets or interactions of the patient-agent construct conceptualized and operationalized in terms of the following interactions and respective verbal indicators. Succorance involves the seeking of help and support. One series of questions asks: Which do you think happens most often, you give something to someone or someone gives you something? Restraint indicates physical and social circumspection by others. A question in this dimension asks: Do you play mostly by yourself or with other children? Finally, inautonomy refers to the lack of self determination and government. The following is illustrative of the questions in this area: Do you ever go places all by yourself, without anyone going along with you? With each question are a series of probes, to elicit both quantitative and qualitative

information about the child's social relations. Responses are scored on a four point scale.

The C.S.R.I. followed the C.O.T. and the C.R.T.T., all of which were t.. e recorded in their entirety. The stimuli within the tasks were administered in random order so as to avoid presentation bias. Although the questions and scoring procedures emerged from pretest sessions, the scoring codes were derived from a content analysis of overall responses. Coding was done on a "blind" basis in so far as coders were unaware of the status of respondents. Total scores were given in each of the categories.

Children's Social Relations Rating Scale (C.S.R.R.S.)

This scale, used as a validity check along with non participant observation, covered the following components: dependence - seeking help, physical contact, proximity, attention, recognition (promise and approval) and extent of social participation; independence - taking initiative, overcoming obstacles, persistence, satisfaction from work, wanting to do things by one's self, and intensity of social involvement.

The illustrative item below is given along with its respective instruction protocol.

1. How often does this child need help or assistance from another person? (By "help" is meant any form of assistance from another person, e.g., doing something for the child, like dressing, washing, finding a toy, pushing him on a swing, protecting him against another when attached or something is taken from him, giving instructions and guidance (like demonstrating how to build or play something, giving what he asks for, e.g., a toy to play with, etc., Beller, 1955).

The child's primary teachers were asked to observe them for a week and rate them on each item according to a seven point scale (Beller, 1955; Hartup, 1963; Yarrow, Campbell, and Burton, 1968).

Procedure

The tape recorded sessions and teachers' ratings were scored and coded by two assistants working independently. These assistants were selected on the basis of prior research experience with children and carefully instructed in the coding and scoring procedures. Intercoder reliability was determined twice during data preparation and once after it had been completed. Discrepancies between the separate codings were discussed in round robin meetings, and finally resolved by the decision of the principal investigator.

In addition to the reliability and validity information provided in the previously reviewed studies, the intruments were assessed in terms of their intra and inter dimension homogeneity. Moreover, the stability of the rating scale employed by the subject's primary teacher was assessed by the determination of test-retest reliability. Due to pretest contamination, the initial ratings were employed in the final data analysis.

The use of a matched group design enabled the employment of the "t" test of significance of assumed normally distributed differences between related samples. Reliability data is based on the Kuder-Richardson formula 20 reliability co-efficeint (KR-20) and Pearson's Product Moment Correlation (Roscoe, 1969). Moreover, a within group deviant case analysis has been provided as a means of determining the nature of those cases of low and high scores that departed from generally predicted trends. This analysis is based on the Mann Whitney U test of significance between groups of unequal size (Lazarsfield, 1972).

Results

The KR-20 Reliability for the C.O.T., C.S.R.I.S., and C.S.R.R.S. was found satisfactory for both groups in terms of the intra-task homogeneity by an internal consistency check depicted in Table 1.

Table 1 about here

Data on the reliability of the C.S.R.R.S. was supplemented by a split half and test - retest check. Consistent with Beller's (1955) previously reviewed report was the finding of a low negative correlation between the scale's dependence and independence dimensions (Disabled, $r = -.37$, $p < .025$; Non disabled $r = -.14$ N.S.).

The test-retest check on the C.S.R.R.S. was in the case of both groups, low but significant. (Disabled, $r = .34$, $p < .05$; Non disabled, $r = .29$, $p < .05$). This finding of rating instability supports the decision, based on the possibility of pretest contamination and the teacher's reluctance to make the desired retest, to use only the first rating in the data analysis.

The two trials involved in the C.R.T.T. were employed in a split half reliability check. Although the existence of a practice effect may have inflated these correlations they were significant (Disabled, $r = .44$, $p < .05$; Nondisabled $r = .56$, $p < .005$).

Three calculations of intercoder reliability were averaged and found satisfactory (Disabled, $r = .81$, $p < .005$; Nondisabled, $r = .75$, $p < .005$).

Significant between task correlations of the C.R.T.T. and the C.O.T. are consistent with those found in the previously outlined studies linking social and cognitive development by Feffer (Disabled, $r = .46$, $p < .005$; Nondisabled, $r = .49$, $p < .005$).

Correlations across all tasks indicates a satisfactory inter-task homogeneity (Disabled, KR-20 .75, $p < .005$; Nondisabled, KR-20, .74, $p < .005$).

These intra-and inter-task correlations indicate a high degree of internal consistancy and stability of the measures employed in this investigation. That is, the subjects's performance in both groups was consistent within and between each of the tasks administered.

The means and statistics on differences presented in Tables 2 and 3 indicate that the disabled and nondisabled groups respectively enact the patient and agent role as predicted by the first and second specific hypotheses.

Tables 2 and 3 about here

In all dimensions the means reveal the disabled child's significant enactment of the patient role and the non diabled child's significant enactment of the agent role.

The third specific hypothesis states that the disabled group of children will display a significantly lower level of achievement of concrete operations than the non disabled group of children. Partial support for the third hypothesis appears in Table 4, depicting the two group's performance on the dimensions of C.O.T.

Table 4 about here

The means and significant differences of the clay (weight) and straw dimensions indicate support for the hypothesis, while the marble and clay (quantity) problems failed to discriminate between the two

groups of children. Likewise, the total score differences on the C.O.T. between the disabled and nondisabled group were not significant.

The fourth hypothesis states that the disabled group of children will display a significantly lower level of role taking activity than the disabled group of children. The two groups' performance of the C.R.T.T. upholding this hypothesis are presented in Table 5.

Table 5 about here

Examination of scores for both groups indicated a number of cases which did not adhere to the scoring pattern predicted by the hypotheses. Although the number of overlapping cases between the two groups was not large, an analysis of deviant cases was undertaken. More specifically, the task scores within each group were arbitrarily divided at their mid-points into low and high sub-group scores. A "U" Test of significance between the cases in each of the variables grouped age, sex grouped, I.Q., and program status. The next step in this analysis was to examine the frequency and percentage distributions of these variables within the high task categories. The intent of this scrutiny of deviant cases was to provide information that may suggest additional variables to be considered, conceptual refinements, and possible reformulation of hypotheses.

The outcome of this analysis reveals differences found significant between the low and high categories of both groups pictured in Table 6.

Table 6 about here

Most of the within group variation appears in the task performance of the disabled children. The older children in the disabled group tend to score high on the agent role dimension of the C.S.R.I.S. and low on the dependence dimension of the C.S.R.R.S. Suggested here is the possibility of an increase in agent role enactment and a decrease in dependence as the child grows older. This occurence can be interpreted as reflecting the acquisition of an increasing amount of autonomy with age. The implication is that the effect of orthopedic disability as a restriction in social experience and involvement may diminish as the child grows older. A possible consequence in need of research is that disability may only be an initial barrier to normal cognitive and social development.

The distinct relation of high I.Q. and high scores on the independence dimension of the C.S.R.R.S. and the dimensions of the C.O.T. coincide with consistently reported interrelation of intellectual functioning and cognitive and social development (Wolfe, 1963).

In regard to the findings associated with the variable of program status it is clear that day-patients score significantly higher than out-patients on the independence dimension of the C.S.R.R.S. and the dimensions of the C.O.T. This finding indicates the possibility of some consequence of institutionalization associated with the program status of once having been an inpatient.

Finally, the finding that the non disabled children's performance on the C.S.R.R.S. dependence dimension was lower and their performance on the C.R.T.T. was higher with increased age are in accord with the previously noted relationship of age and the achievement of role taking activity.

Discussion

The findings of this investigation suggest that the social position of the disabled is such that he may be impaired in his cognitive and social development.

The deviant case analysis undertaken points to a paradox in attempts to deal with the developmental problems associated with orthopedic disability. On one hand, it indicates a need to provide special individualized instruction for those children able to derive its benefit and, on the other hand, the desirability of placing the child in an environment that fosters typical social experience and involvement.

In addition, the requirement of activity on the part of the child was underscored by the results of this study. That is, the child seeks out stimulation rather than avoiding or reducing it. If current structures are available he uses them and if new meanings are required, he creates them. Thus, efforts to foster social cognition might be made more effective by focusing on opportunities for unrestricted social interaction.

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TABLE 1

Intra-Task KR-20 Reliability for C.O.T., C.S.R.I.S., and C.S.R.R.S.*

	Disabled	Non Disabled
C.O.T.		
Clay (quantity)	.96	.91
Marble	.90	.91
Straw	.96	.87
Clay (weight)	.99	.99
Total	.93	.94
C.S.R.I.S.		
Succorant--Nurturant	.64	.64
Restrained--Unrestrained	.57	.60
Inautonomous--Autonomous	.74	.42
Total	.78	.76
C.S.R.R.S.		
Dependent	.75	.71
Independent	.89	.80

*All significant at $p < .005$; D.F., 39

TABLE 2

C.S.R.I.S. Between Group Differences of Means*

(Patient 1-3 Agent)

Dimension	Disabled	Non Disabled	Variance	T Score
Succorant--				
Nurturant	1.60	2.32	.28	3.58
Restrained--				
Unrestrained	1.70	2.44	.30	5.24
Inautonomous--				
Autonomous	1.58	2.41	.11	1.78

*All significant at $p < .05$; D.F., 39

TABLE 3

C.S.R.R.S. Between Group Differences of Means*

Dimension	Disabled	Non Disabled	Variance	T Score
Dependent	5.11	3.00	.01	6.60
Independent	3.48	5.95	.10	5.95

*All significant at $p < .005$; D.F., 39

TABLE 4

C.O.T. Between Group Differences of Means
(Wrong 1 - 2 Right)

Dimension	Disabled	Non Disabled	Variance	T Score	Probability
Clay (weight)	1.49	1.77	.85	4.46	($p < .005$)
Marble	1.54	1.66	.41	.50	(N.S.)
Straw	1.79	1.88	.23	2.97	($p < .01$)
Clay (Quantity)	1.34	1.71	.56	.42	(N.S.)
Total	1.54	1.76	3.17	1.51	($p < .10$)

TABLE 5

C.R.T.T. Between Group Differences of Means

(Low 1 - 10 High)

Disabled	Non Disabled	Variance	T. Score	Probability
3.05	4.68	35.58	7.49	($p < .005$)

TABLE 6

High And Low Score Within Group Differences*

Task	Variable	U. Value	Z-Score*
Disabled Group			
C.S.R.I.S.	Age	42	2.38
C.S.R.R.S. (Independent)	Status	36	2.50
C.C.T.	Age	69.5	2.72
C.O.T.	I.Q.	40	2.34
Non-Disabled Group			
C.S.R.R.S. (Dependent)	Age	229.5	2.91
C.R.T.T.	Age	248	2.36

*All significant at $p < .05$

SOCIAL EXPERIENCE AND THE DEVELOPMENT OF SOCIAL COGNITION

IN ORTHOPEDICALLY DISABLED AND NON DISABLED CHILDREN

Abstract

This study is an attempt to make explicit some of the social experiences implicated in the decline of egocentrism in children between the ages of six and twelve by comparing the social and cognitive development of orthopedically disabled and non disabled children.

Eighty children participated in this investigation. Forty were selected from a hospital school for the orthopedically disabled and forty were drawn from public schools. Children in the two subject pools were matched according to age, sex, and I.Q.

The general hypotheses that the achievement of concrete operations and role taking activity are fostered by the agent role and retarded by enactment of the patient role were supported.

This study suggests that attempts to induce competence in social relations could be improved through focus on actual social experience and involvement.